

P55 Exploration of Methods in the Exploding Wire Technique for Simulating Large Blasts

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Abstract:

The numerous benefits of small scale laboratory experiments include shorter preparation and execution times, cheaper materials, usage of measurement devices that cannot be employed in field tests, and a compactness that often allows for more controlled test conditions and provide high repeatability. The exploding wire technique has been employed successfully in the simulation of small blast-structure interactions [1]. By discharging a large capacitor on a thin piece of wire, a scaled-down explosion can be simulated in laboratory conditions. TNT equivalents between 60-100 mg were achieved, though the requirement to simulate larger blasts, such as from the detonation of a 1-Ton TNT equivalent bomb has stimulated efforts to pursue a scaled-down TNT equivalent of 800 mg in the exploding wire facility. Various methods have thus far been experimented to achieve the desired higher values, such as material adjustments and the design of additional auxiliary structures. Numerical analysis using the LS-DYNA solver has offered both validation of progress and guidance in choosing a course of exploration. Modifications to the existing wire technique will be presented, in addition to a summary of results and conclusions.

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